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carried. I then cut out of the two upper thirds, supposing the under half to be divided into three parts, sufficient to take the bearing of those parts, so that the friction and weight rest only on the sixth part of the axle-tree. The bearing part I leave larger or smaller, agreeable to the weight intended to be carried.

In some cases I fix small rollers, two or more, as occasion may require, in recesses cut for that purpose in the bottom of the axle-tree. These rollers turn on their own axis in pieces of steel, or any other hard metal, also fixed in the said recesses. In this case the bottom of the axle-tree must be flattened, in order to throw the weight on the rollers. I then make a groove the length of the arm on the top-side, with small holes through the axle-tree to admit of oil flowing through to supply the axis of the rollers with sufficient moisture. In this case the box or bush must be made with a cap at the point or shoulder, or with caps both at the point and shoulder, to contain oil, as is frequently practised on different principles: or I supply the axle-tree with oil through a pipe, introduced through the shoulder-washer; at the upper end of which pipe I screw a can, cap, or hollow ball, to contain oil.

These several improvements may be used either separately or collectively. In cases where the box or bush is a fixture, instead of cutting away the axle-tree, I make the alteration in the bottom half of the box in the same way as described for the axle-tree. When horizontal axle-trees are used, the arm of the axle-tree should be of the same size at the point as at the shoulder, and the wheel made perfectly upright, without any dish.

In witness whereof, &c.

Patent of Mr. Charles Williams, of Gravel-lane, Southwark, Millwright, for a machine for grinding or cutting malt, splitting beans, or other grain, and various other articles.

Da'ed, August, 1810.

THIS machine is composed of a horizontal roller of steel or iron, grooved longitudinally on its surface, with channels a little inclined to a spiral direction, and having an angular section, with one side of the angle nearly in the line of the radii of the roller: a piece of steel or iron, hollowed to correspond with the curvature of the roller, and furnished with similar grooves at its concave side, is placed in the same direction with it, at a proper distance, which may be encreased or diminished by adjusting screws, that pass from its ends towards the axis of the roller; this latter part may also be formed of a number of cutters or knives, placed in the direction mentioned, and kept tight together by screw bolts passing through them.

Each end of the axis of the roller works in a brass socket, that is capable of a sliding motion at right angles to the axis, in a frame properly fitted for this purpose; at each of these sockets a bent lever is adjusted in such a manner, that a weight on its longer arm tends to press the socket (and consequently the roller) towards the cutters, or hollow grooved bar; and the weight on the lever can be moved closer to or farther from the center of motion, so as to adjust the pressure to the degree desired; by this means if any extraneous body, should by chance get among the corn, which is too hard to be cut, it will force the roller from the cutters, and pass through without damaging the engine, and the weighted levers will immediately bring the roller again to its proper place.

A double wire screen, about three times the length of the roller, is placed above it, inclined towards it in an angle of about 25 degrees; at the upper end of this screen the hopper is fixed, in which is put a wire screen to take out the thickest of the rubbish, of straw and other matters mixed among the grain — Projections from the roller act against a part of the lower end of the screen prepared for the purpose; by which a motion is given to the screen, that shakes forward the malt or other matter; at the front of the hopper a small slider is fixed, to adjust the size of the aperture, through which the grain passes to the screen; and the screen is enclosed in a sort of trough, with sides which rise above it; and from one side of its lower end, a spout projects, to clear off the rubbish that is separated from the grain.

The grooved roller may be turned by any power most convenient.

Observation.—This machine is evidently formed on a principle similar to that of common coffee mills. It can only reduce grain to a coarse powder, such as is required for malt, or for feeding cattle, but does not appear capable of grinding sufficiently fine to make flour.

Machine for cutting roots for cattle, articles for dyer's use, or for culinary purposes; invented by Mr. Thomas Newton, of Bridge-street, London.

Trans. Soc. Arts.

THIS machine is composed of a trough, curved into a circular form, and of five chopping blades united to one handle, one end of which is fastened to a point at the center of the circle, of which the curve of the trough forms a part, and the other end serves as a lever to press the blades downwards into the trough.

Each of the blades is the length of the trough's breadth, and somewhat deeper than the trough, and has two tenants rising from its back, which passing through corresponding mortices in a piece of wood fixed beneath the handle or lever, serve to keep them firmly united to it, and are farther secured by pins which pass through them transversly through holes in the parts of them that project beyond the wooden bed. An iron plate having slits made through it, to admit the blades to pass, and of the same length and breadth as the blades, is by a bar that projects from it, fastened to a hinge beneath the lever, so as to admit the blades to move up and down through the slits, at the same time that it accompanies them in the lateral motion to different parts of the trough, as the lever to which they are attached is moved round the pivot: The use of this plate is to clean the chopping blades from any part of the cut substance which sticks to them; two pieces rise from the tail of the plate at each side of them, which hold a pin that prevents the blades from coming quite through; and a spring is placed between the tail of the plate and the lever, which raises the latter up, and causes the chopping to be performed more speedily, as the hand has only to free down the lever, which the spring raises.

THIS machine is particularly well calculated for the chopping of sausage meat. Though its value in this latter respect may at first appear inconsiderable, yet the great demand in most towns for that article, and the many hands it requires to make the meat fit for use, will, on enquiry, shew that it is of consequence. Many of the sausage-makers employ four or five men constantly in this business, and frequently three or four hundred weight of